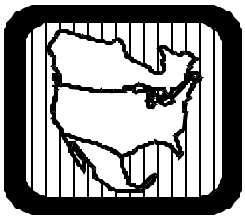
Preparing the Electric Power Systems of North America for Transition to the Year 2000

A Status Report Update
Third Quarter 1999

November 18, 1999

Prepared for the
United States Department of Energy

By the
North American Electric Reliability Council



Year 2000 Readiness Disclosure
Pursuant to the Year 2000 Information and Readiness Act, Pub. L. No. 105-271, 112 Stat. 2386 (1998)

Electric Power Industry Year 2000 Status Update

Background

The North American Electric Reliability Council (NERC) is facilitating a Y2k readiness reporting process for the electric power industry of North America in response to a May 1998 request from the U.S. Department of Energy (DOE). In that letter DOE requested:

- "NERC's assistance in assessing whether the Nation's electricity sector is adequately prepared to address the upcoming Year 2000 computer problem."
- That NERC "undertake the coordination of an industry process to assure a smooth transition [to the Year 2000]."
- That NERC provide DOE with written assurances that "critical systems within the Nation's electric infrastructure have been tested, and that such systems will be ready to operate into the Year 2000."

On August 3, 1999, NERC delivered to DOE the fourth in a series of quarterly reports on efforts to prepare electric power supply and delivery systems of North America for operation into the Year 2000 (Y2k). This report stated that NERC believed then that the electric systems in North America would operate reliably into the new millennium based on the state of readiness of the industry at the time of the report. NERC also took the unprecedented step in August of publicly disclosing those 251 entities it believed had met NERC criteria for having mission-critical electric systems Y2k Ready or Y2k Ready With Limited Exceptions.

The August 1999 report documented the systematic and thorough process completed by all sectors of the electric power industry to test and, as needed, repair or replace all mission-critical systems with potential date sensitivities. Although the report noted that 1 to 3% failure rates were typical in unremediated systems, test failures that could indicate a possible impact on electricity production or delivery were extremely rare. All systems that did fail the tests, even when the impact was only a minor nuisance, have been replaced, repaired, or remediated to the extent that the primary functions of components and systems are expected to continue reliably. The August 1999 report also reviewed steps by the industry to further minimize any Y2k-related risks by assuring that contingency plans and resources are at the fullest state of readiness.

The August 1999 NERC report to DOE identified four issues that required follow-up. The purpose of this report is to provide an updated industry status report and, in so doing, address these four issues. The four issues were:

- Some bulk entities were not Y2k Ready by the industry target of June 30, 1999.

Electric Power Industry Year 2000 Status Update

- Some distribution entities were not Y2k Ready by the industry target of June 30, 1999.
- The electric power industry is highly dependent on voice and data communications.
- Vendor dependencies may be delaying completion of testing and remediation of EMS and SCADA[1] systems, DCSs[2], emissions monitoring analyzers, and customer information systems.

Due to the interconnected nature of the electric systems in North America, the scope of this status update report includes power systems in the United States and Canada, and the northern portion of the Baja California Norte, Mexico.

[1] EMS is energy management system. SCADA is supervisory control and data acquisition. Both are computer systems used in electric power control centers to manage the real-time operation of electric systems.

[2] DCS is distributed control system, a modern computer-based control system to manage the real-time operation of a power generating plant.

Electric Power Industry Year 2000 Status Update

Conclusions

The following major conclusions are supported by results reported during the third quarter of 1999. Details are provided in the remaining sections of this report.

1. 276 bulk electric entities are Y2k Ready; 17 remain as Y2k Ready With Limited Exceptions. There are no bulk electric entities remaining in the not ready category.

2. Substantial progress has been seen in local distribution systems. Both the American Public Power Association and the National Rural Electric Cooperative Association report Y2k Ready status for distribution organizations that serve more than 99.8% of customers (meters) in their respective sectors. NRECA is releasing an Honor Roll indicating rural cooperatives it believes to be Y2k Ready.

3. The nuclear sector has completed 100% of Y2k testing and remediation at all plants in the United States.

4. A DOE report on 36 independent onsite audits is consistent with the voluntary self-reported data from the industry. A second report with 17 additional audits will be released soon by DOE.

5. The electric power industry continues to address its primary vulnerability, which is voice and data communications, through redundant systems, coordination with the telecommunications industry, and drills.

6. The electric power industry conducted a comprehensive Y2k drill on September 8–9 to rehearse its plans and procedures for the December 31 rollover to January 1, 2000.

7. The electric power industry has prepared business continuity plans and contingency plans to further assure that Y2k does not impact the ability of the industry to continue providing reliable service into the new millennium.

Electric Power Industry Year 2000 Status Update

Status Update of Bulk Electric Transmission and Generation Entities

The August 1999 NERC report identified 187 bulk electric entities that were Y2k Ready and 64 entities that were Y2k Ready With Limited Exceptions[3]. The report noted that 17 entities were not ready according to the NERC criteria.

As shown in Figure 1 below, the number of Y2k Ready entities has increased from 187 to 276. The number of entities that are Y2k Ready With Limited Exceptions has decreased from 64 to 17, as these organizations completed the testing and remediation of their remaining few items. The number of entities that are considered to not be ready has decreased from 17 to none. This improvement is a result, at least in part, to the efforts by DOE and NERC to follow-up individually with these organizations.

To the best of NERC's knowledge, these reporting entities account for all bulk electric organizations in North America, including transmission systems, power producers (including all independent producers with 300 MW or more of production capacity), control areas, and Regional security coordinators. Municipal and other public power organizations that operate transmission and generation, as well as G&T[4] cooperatives are included in this data.

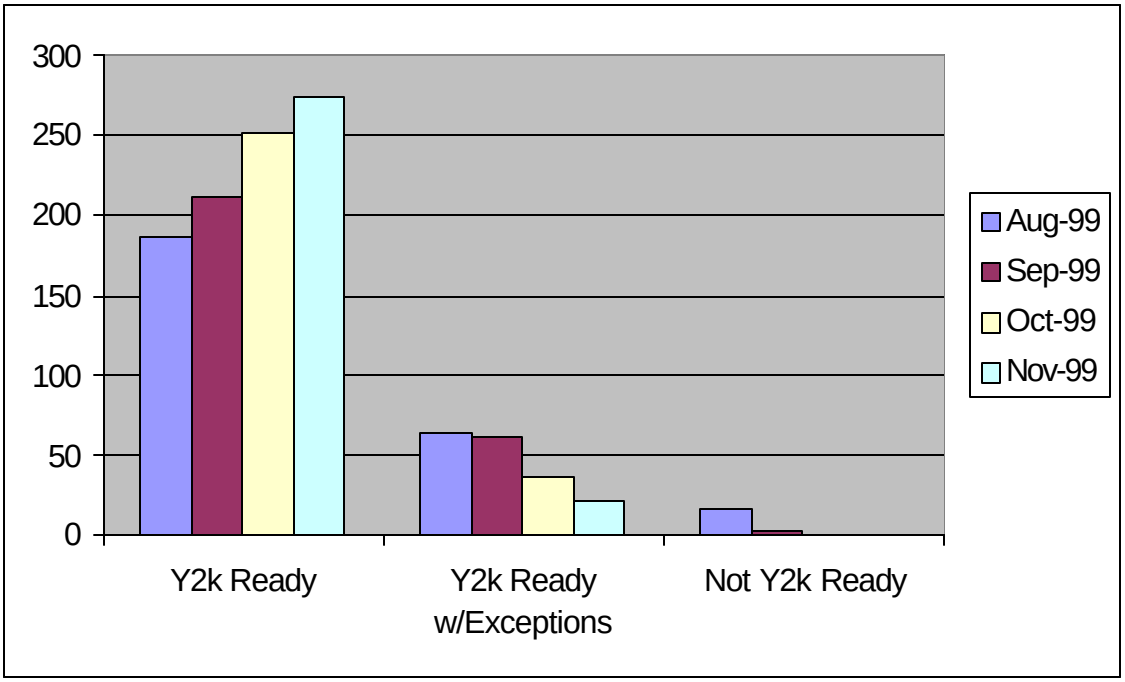


Figure 1 – Bulk Electric System Entity Readiness Status

[3] These criteria are defined in the August 3, 1999 NERC report to DOE.
[4] A G&T cooperative is one that operates generation and transmission for its member distribution cooperatives.

Electric Power Industry Year 2000 Status Update

An updated list of entities that NERC believes to be Y2k Ready or Y2k Ready With Limited Exceptions is provided in Appendix A. Appendix B is an update of the Non-nuclear Exceptions List, indicating specific items that have been completed since August 3, 1999 and items remaining to be completed. These documents are updated about weekly on the NERC Y2k web site at http://www.nerc.com/y2k.

Of the 17 entities with remaining exceptions, five have missed their originally stated schedule for completing the item(s). Of these, three are less than one month late and two are less than two months late. NERC will continue to track the status of these items, as well as other remaining items on the exception list to assure closure sufficiently ahead of the end of year rollover. One exception, scheduled for completion in February 2000, involves an extended maintenance outage and rebuilding of a generating unit that would not have been available at the end of the year anyway and is not needed for the rollover.

Electric Power Industry Year 2000 Status Update

Status Update of Public Power Entities

There are 2,012 public power distribution systems serving about 14% of electricity customers in the United States. The August 1999 NERC report stated that about 80% of public power organizations were Y2k Ready, 6% were not Y2k Ready, and 14% were unknown.

In the third quarter of 1999, the American Public Power Association (APPA) reviewed the results of its previous surveys and determined which entities had not been positively identified as being Y2k Ready at least once already. APPA then contacted each of these entities to verify their Y2k status. The results of this final survey indicate:

- All 2,012 public power entities have been included in the APPA process (100% coverage)
- 1,990 public power systems are Y2k Ready as of October 1999
- The remaining 22 public power systems (0.16% of meters served) will be Y2k Ready before the end of the year
- The Y2k Ready organizations represent 17,736,344 (99.84%) of meters served

These improved results show significant improvement and address one of the key concerns raised in the August 1999 report. Although individual public power entities are not identified as Y2k Ready, the virtual completeness of the aggregate results provide sufficient assurance that the public power sector is ready for the new millennium. A list of entities that have participated in the APPA survey process is included on the NERC Y2k web site at http://www.nerc.com/y2k.

A more detailed summary of the APPA results is provided in Appendix C.

Electric Power Industry Year 2000 Status Update

Status Update of Rural Cooperatives

There are 858 rural electric cooperatives that provide service to 13,840,998 customers (meters) throughout the United States. Based on surveys facilitated by the National Rural Electric Cooperative Association (NRECA), 847 of these cooperatives are Y2k Ready. The remaining 11 are Y2k Ready With Limited Exceptions according to NERC criteria. The 11 entities with exceptions are expected to complete these items before the end of the year. NRECA will continue to track their progress.

A list of electric cooperatives that, based on the results of five quarterly surveys, NRECA has determined to be Y2k Ready is provided in Appendix D. This list does not include the systems that declined to be listed, even though they are Y2k Ready, and also does not include those that are Ready With Limited Exceptions.

NRECA's approach in support of the NERC Y2k reporting process started in August 1998 with a telephone survey of 875 rural distribution systems and included non-member cooperatives. The NRECA survey questions approximated those on NERC's readiness assessment questionnaire, but did not include questions on generation because these cooperatives do not control generation assets. The generation and transmission (G&T) cooperatives that do own generation are reporting through the NERC process.

In March 1999, NRECA finalized a list of 858 rural electric distribution systems, thus accounting for the members in common with APPA. The list also was updated to include several recent cooperative mergers. Information from the August 1998 survey established a baseline set of data on the amounts and types of equipment at each distribution cooperative. NRECA surveyed each of its member rural electric distribution cooperatives (and non-member cooperatives) three more times, using a fax-back form.

The March 1999 survey included questions on the relationships between the distribution cooperatives and their wholesale power suppliers, in addition to the questions about SCADA/EMS, telecommunications, and distribution system automation closely patterned on NERC's readiness assessment. Uncertainty about bulk power supply readiness was the major concern expressed by cooperatives prior to this survey. Responses to the questions about bulk power supply readiness helped to demonstrate a high level of cooperation and communication between distribution cooperatives and their power suppliers.

The fourth survey was conducted by NRECA at the end of June 1999. NRECA reviewed the March 1999 data to determine patterns in readiness dates, anomalies in answers (such as testing completed in June but not ready until December 1999), and strong use of digital electric distribution technologies. Cooperatives whose responses included anomalies or showed a significant use

of digital electric distribution technology were faxed a detailed form, essentially the same as they had received during previous surveys. The rest of the cooperatives were faxed a one-page form containing questions closely patterned on NERC's Y2k readiness benchmarks, such as regular reports to boards of directors, written plans, completion percentages and dates for the phases of Y2k work defined by NERC, and other questions.

NRECA received 821 (96%) responses to its June 1999 survey indicating completion of 99% of Inventory, 98% of Assessment, and 91% of Remediation and Testing. About 25 cooperatives that did not respond in June repeatedly reported Y2k ready dates ranging from December 1998 through June 1999 on previous surveys. NRECA has detected a strong reluctance on the part of cooperatives that have been ready for months and previously reported that readiness, to continue the redundant reporting. Upon reviewing the results of the June 1999 survey and three previous surveys, NRECA determined that 692 cooperatives had already reported they would be Y2k Ready by the end of the third quarter of 1999.

The remaining 166 cooperatives were surveyed again in October 1999 and asked to indicate their readiness status. They also were asked that, assuming that they would be ready by November 1, 1999, would they object to being included on an "Honor Roll" of Y2k Ready systems. All 166 cooperatives submitted written responses. From the responses, NRECA determined that an additional 155 systems are now Y2k Ready, bringing the total to 847 entities that are Y2k Ready (98.7%). For various reasons some of these cooperatives, although they are Y2k Ready, <u>do object</u> to being included on the "honor roll."

Electric Power Industry Year 2000 Status Update

Nuclear Status Update

The Nuclear Energy Institute (NEI) has supported the NERC Y2k reporting process since 1998, in parallel with implementing its own reports to the Nuclear Regulatory Commission (NRC). NEI recently released a status update indicating all 103 commercial nuclear power reactors in the United States have completed their Y2k readiness programs. Reactor readiness programs are based on comprehensive, standardized industry guidelines in "Nuclear Utility Year 2000 Readiness."

The nuclear sector of the electric industry has tested about 200,000 items that could be susceptible to Y2k issues. Of these, about 5% required some type of remediation. At this point, all 103 reactors have completed all Y2k testing and all remediation. Each facility also has prepared contingency plans for key rollover dates.

NEI guidelines and a more detailed report are available at http://www.nei.org.

The NRC has reviewed the nuclear sectors program and activities for the past two years, including onsite program evaluations. NRC audits have confirmed that nuclear power plants will continue to generate electricity safely and reliably into the Year 2000. The Commission also concurs that all safety systems will function, if required, to safely shut down a plant. The NRC status information on Y2k status may be found at http://www.nrc.gov/NRC/NEWS/year2000.html.

Electric Power Industry Year 2000 Status Update

Independent Y2k Reviews

DOE has commissioned 56 independent audits of electricity organizations across all sectors except nuclear (which has been verified by the NRC). A report on the initial 36 independent audits (Phase 1) has been completed and is available on the DOE and NERC Y2k webs sites. The Phase 2 report on the final 17 audits is to be delivered to DOE soon.

All 36 entities that were randomly selected in the Phase 1 group of audits agreed to allow an on-site audit of their Y2k program. There were no refusals to participate.

The Phase 1 DOE audit report compared the consistency between the onsite audit findings and the self-reported data that had been sent to NERC. Of the 32 entities for which direct comparisons were available, 27 entities had provided consistent reports, two entities had overstated their readiness, and three understated their readiness. Comparison information was not available for four of the entities.

Viewed from the aggregate, the industry's self-reported data appears to be reasonably accurate and balanced. Viewed on an individual organization level, there were subjective judgments regarding Y2k readiness — some judgments have been made over-conservatively and some under-conservatively. On a whole the judgments appear to balance.

The Phase 1 audits also examined the question of whether smaller, local distribution systems are at any greater risk for Y2k than larger systems. These smaller distribution systems were not found to be at any greater risk, because:

- Most of the smallest distribution entities do not have digital devices or computer systems used in the delivery of electricity and do not own generation.
- Small, local distribution systems are aware of the Y2k issue and are doing a good job in executing their Y2k remediation and testing.
- Although small distribution systems may have started their Y2k efforts later than larger systems, the limited number of digital items in their inventories allowed them to complete the efforts in a shorter period of time.

Several other key findings were provided in the DOE Phase 1 audit report:

- The entities that were delayed beyond the June 30, 1999 industry target had completed their programs with the exception of a SCADA system or customer information system that was pending an upgrade, testing, or certification by an external vendor.

Electric Power Industry Year 2000 Status Update

- There is a great amount of diversity and local judgment applied in developing Y2k testing methods and criteria. Most of the testing concerns identified during the on-site visits were related to SCADA systems.
- There were no apparent geographic differences related to Y2k readiness.

The Phase 2 audits are intended to further investigate the issues outlined above. This report will be completed in the very near future.

Electric Power Industry Year 2000 Status Update

Dependency on Voice and Data Communications

Dependency on voice and data communications continues to be a top priority for the electric industry. Operation of electric systems is highly dependent on voice and data communications, some of which is operated by external service providers. The dependence on voice and data communications directly affects real-time operations and control of electric systems and, therefore, continues to require attention in contingency planning and preparations. To mitigate this dependency, the following steps have been taken:

- NERC-facilitated integrated Y2k tests between several electricity organizations and two major communications carriers covering facilities in three states: New York, New Jersey, and Pennsylvania. A separate report on this test activity has been published and is available on the NERC Y2k web site at http://www.nerc.com/y2k.
- Electricity organizations have conducted face-to-face meetings with their communications service providers to share Y2k readiness information.
- NERC has facilitated two industry-wide drills that emphasize the capability to operate with loss of communications through the use of redundant systems, including radios and satellite phones.
- Through an inter-industry working group, the electric power industry has coordinated information sharing and contingency planning with other key infrastructure sectors, such as: communications, natural gas, oil, and transportation.

Although everything that can be technically done to mitigate this vulnerability has been done, NERC and the electric industry will be closely coordinating information sharing with the telecommunications industry during the end of year transition. This information sharing will occur locally as well as at the national level to assure that essential electric power and telecommunications infrastructure dependencies are effectively coordinated.

Electric Power Industry Year 2000 Status Update

Vendor Supply Chain Dependencies

Satisfactory progress in the third quarter of 1999 in resolving Y2k Ready exception items (Appendix B) is a positive indication that concerns about dependency on software vendors to complete testing and remediation of EMS, SCADA, DCS, emissions monitoring, and customer information systems are not as problematic as initially suspected. Although a significant percentage of the delays past the NERC Y2k readiness target of June 30, 1999 were caused by software vendor resource limitations, those remaining items have been resolved close to schedule in the third quarter and will be completed prior to the end of year rollover.

Electric Power Industry Year 2000 Status Update

September 8–9 Y2k Drill

On September 8–9, 1999, the electric power industry conducted a major drill. This Y2k drill provided the bulk electric power systems of North America an opportunity to rehearse, under simulated conditions, key portions of their administrative, operating, communications, and contingency response plans for the transition into the Year 2000.

Three major objectives were identified to guide development, implementation, and evaluation of the drill:

1. Demonstrate the ability to effectively deploy resources and perform operating and administrative procedures related to the transition from December 31, 1999 to January 1, 2000.
2. Demonstrate, under simulated conditions of a loss of one or more primary voice or data communications systems, the ability to effectively use backup voice communication systems in support of reliable electric operations.
3. Demonstrate, under simulated Y2k conditions, the ability to effectively deploy (deployment could be simulated) elements of Y2k contingency response plans.

A full report on the drill has been delivered to DOE. The report indicates that more than 20,000 people across the United States and Canada participated in the drill at over 500 electric utilities and 1,000 facilities (control centers, power plants, and substations). Control center operators, power plant operators, substation technicians, computer technicians, and many others performed their roles in the drill as they will on December 31.

The centerpiece of the drill was observing the rollover past midnight from September 8 into September 9 and closely monitoring systems. Drill participants were trained in their responsibilities and were prepared to respond to any unusual conditions. As the passing of midnight occurred into September 9, through the Maritimes in Canada, the Eastern, Central, Mountain, and Pacific times, the electric systems in North America experienced five midnights. The drill also included simulations of advanced warning from New Zealand, Australia, Europe, and other time zones in which midnight occurs earlier than in North America.

At no time during the drill were any electric customers affected. No actual Y2k or 9/9/99 problems were reported during the conduct of the drill and all systems worked as planned.

The drill started early in the morning of Sept 8 and ran through midnight in the Greenwich Mean Time (GMT), Maritimes, Eastern, Central, Mountain, and

Electric Power Industry Year 2000 Status Update

Western time zones. The exercise ended in the early morning hours of September 9.

A diverse mix of contingencies and activities were simulated during the drill including:

- Loss of EMS/SCADA/data communications
- Use of backup control centers
- Testing black start units and walking through restoration procedures
- Some systems operating with extra generating reserves
- Simulating communications failures and backup voice systems with field personnel, power plants, control areas, and security coordinators
- Simulating loss of load, generation, and transmission
- Simulating loss of transmission reservation and scheduling systems
- Simulating loss of computer systems
- Utilities setting up emergency operations centers, storm centers, customer service centers, and media information centers
- Communicating with emergency management services

The full report on the September 8–9 Y2k drill, including a detailed list of lessons learned, is available on the NERC Y2k web site at http://www.nerc.com/y2k.

Electric Power Industry Year 2000 Status Update

Business Continuity Plans

NERC and the electric power industry are using a "defense-in-depth" strategy to minimize risks associated with the end of year rollover. This strategy requires thorough testing and remediation to address all Y2k technical issues, as described in previous sections of this report. "Defense in depth" involves assuring that if some unexpected problems do occur, then each organization is ready to deal with these problems so as to minimize the impact to the business continuity of the organization and to its electricity customers.

Y2k business continuity and contingency plans express the specific operating and response plans of each operating entity and Region. It is necessary that these plans be customized to local reliability requirements. However, there are several common threads that run through most entities and Regions:

- Staffing Critical Facilities — During the Y2k transition periods, operating entities are planning to place additional operating and technical personnel in essential substations, power plants, operating centers, and other key facilities. In most cases, steps have been taken to curtail vacations and adjust staffing schedules during the critical periods. These additional personnel will allow more secure operations and a timely response to any conditions that may arise during the Y2k transition period. Additional computer support, communications, and management personnel also will be available at key locations to assure continuity of essential services and information. Personnel are being trained in their roles and are being provided opportunities to practice those roles during the NERC Y2k drills, as well as other company drills.
- Backup Communications — To address the dependency on voice and data communications, electric power organizations are using existing and newly installed redundant communications. Mobile radios, satellite phones, internally owned PBXs, cell phones, and other systems afford electric utilities two, three, and in some cases four independent ways to communicate with operating personnel. Practicing the use of backup voice communications has been the focus of the NERC Y2k drills. With a possible loss of data communications, a bare minimum of operating information can be transferred by voice to the control center to allow continued safe and reliable operation.
- Commitment of Additional Generation Resources — All operating entities are planning for the provision of additional generation resources during the Y2k transition periods. In most cases, base loaded units will be backed off from maximum output to some lesser amount. This approach will make room for additional units to be operated, which normally would not run during the New Year holiday long weekend. Most units will be operating at a reduced output above the minimum and below the maximum allowable for the unit. This approach allows the system operator maximum flexibility to increase or decrease unit outputs in response to higher or lower than expected customer

demands. Some units may be running but synchronized to their own plant loads rather than the Interconnection. This approach allows the unit to operate as a reserve that can be synchronized within a few minutes if needed.

- Nuclear Plants Operate Normally — Nuclear plants are expected to operate at either normal output or in some Regions at outputs slightly lower than their maximum, such as in the 80–95% output range. Reducing the output of nuclear units allows greater flexibility to the system operator to operate other types of units. Nuclear plant operators and system operators will finalize operating strategies for the nuclear facilities based on assuring the utmost of safety for the plant and meeting the electrical needs of the power system.
- Reduce Transfer Limits on Bulk Transmission System — Many systems are considering some reduction in the amount of energy transfers they will allow across key transmission facilities. This strategy ensures transmission lines, transformers, high voltage DC systems, and other transmission facilities are not loaded to their maximum transfer capability. For example, a group of transmission lines that make up a power transfer interface may be limited to 80% or 90% of their normal maximum rating to allow greater flexibility and security. Reducing transfer limits will not impact the ability to serve customers, because an abundance of generation will be available. So much additional generation is expected to be on line that electricity transfers will be even lower than they normally are during a holiday weekend.
- Fuel Supply Flexibility — Fuel supply is not expected to be a major risk for electric operations. Coal and oil supplies will be assessed to assure adequate supplies are on hand at the generator. Many organizations are temporarily increasing the supplies above normal levels as a precaution. Natural gas supplies are for the most part in the gas pipeline. Availability of natural gas is being coordinated with those suppliers. Hydro reservoirs will be adjusted to ensure maximum reserve capacity is available. Pumped storage facilities will be in a position to either pump or generate depending on system demand. Although fuel supply is not seen as a major risk, the strategy is to maintain maximum flexibility to use alternative types of fuels.
- Curtail Short Term Maintenance — Most organizations plan to make all generation, transmission, and distribution facilities available for operation during the Y2k transmission periods. This approach requires the curtailment of maintenance activities that might normally result in a portion of facilities to be out of service. Some facilities that are in a major overhaul or under construction may be excluded.

Appendix A

List of 296 Organizations Meeting NERC Criteria for Y2k Ready or Y2k Ready with Limited Exceptions

Electric Power Industry Year 2000 Status Update

List of 296 Organizations Reporting to NERC Y2k Ready (R) or Y2k Ready With Limited Exceptions (RE)

R Adirondack Hydro Development Corporation
R AES Corporation
R AG-Energy, L.P. (Sithe)
R Alabama Electric Cooperative, Inc.
R Allegheny Electric Cooperative, Inc.
R Allegheny Energy
R Alliant Energy (formerly Interstate Power Co., IES Utilities, Inc., & Wisconsin Power & Light Co.)
R Ameren Corporation (formerly Union Electric Co. and Central Illinois Public Service Co.)
R American Electric Power (Columbus Southern Power Co., Ohio Power Co., Indiana Michigan Power Co., Appalachian Power Co., Kingsport Power Co., Kentucky Power Co., & Wheeling Power Co.)
R Ames (Iowa) Municipal Electric System
R Anderson Municipal Light & Power
R Applied Energy, Inc. Naval Station Energy Facility
R Applied Energy, Inc. North Island Energy Facility
R Applied Energy, Inc. NTC/MCRD Energy Facility
RE Arizona Electric Power Cooperative, Inc.
R Arizona Public Service Company
R Arkansas Electric Cooperative Corporation
R Associated Electric Cooperative, Inc.
R ATCO Electric (formerly Alberta Power Limited), including The Yukon Electrical Company Limited, Northland Utilities (Yellowknife) Limited, and Northland Utilities (NWT) Limited
R Austin Energy — City of Austin Electric Utility Department
R Avista Corporation (formerly Washington Water Power Company)
R Baltimore Gas and Electric Company
R Bangor Hydro Electric Company
R Basin Electric Power Cooperative
R Big Rivers Electric Corporation
R Black Hills Power and Light Company
RE Black River Limited Partnership (Fort Drum)
R Board of Public Utilities Kansas City, Kansas
R Bonneville Power Administration
R Boston Edison
R Brazos Electric Power Cooperative, Inc. (Texas Muni Power Pool)
R Brazos River Authority
R British Columbia Hydro and Power Authority (BC Hydro)
R Bureau of Reclamation
R Burlington, Vermont Electric Department
R Cajun Electric Power Cooperative, Inc.
R CalEnergy Company, Inc.
R California Department of Water Resources

Electric Power Industry Year 2000 Status Update

R California Independent System Operator Corporation
R California Power Exchange
RE Calpine Corporation
R Cardinal Power of Canada, L.P.
R Carolina Power & Light Company
R Cedar Falls Utilities
R Central and South West Corporation (Central Power & Light Co., Public Service Co. of Oklahoma, Southwestern Electric Power Co., & West Texas Utilities)
R Central Hudson Gas & Electric Corporation
R Central Illinois Light Company (CILCO)
R Central Iowa Power Cooperative
R Central Louisiana Electric Company (CLECO)
R Central Maine Power Company
R Central Vermont Public Service Corporation
R Chelan County Public Utility District
R Chicopee Municipal Lighting Plant
R Chugach Electric Association, Inc.
R Cinergy Corporation
RE City of Anaheim Public Utilities Department
RE City of Columbia, Missouri
R City of Dover Mckee Run and Van Sant Generation Stations
R City of Farmington, New Mexico
R City of Homestead, Florida
R City of Pasadena, Water and Power Department, California
RE City of Redding, California
RE City of Springfield, Illinois — City Water, Light & Power
R City of Tallahassee, Florida — Electric Department
RE City of Vero Beach, Florida
RE City Public Service — San Antonio, Texas
R City Utilities of Springfield, Missouri
R Cogentrix Energy, Inc.
R Colorado Springs Utilities
R Comision Federal de Electricidad
R Commonwealth Edison
R Commonwealth Energy System (Cambridge Electric Light Co., Canal Electric Co., & Commonwealth Electric Co.)
RE Conectiv (Atlantic City Electric Co. & Delmarva Power & Light Co.)
R Consolidated Edison of New York, Inc.
R Consumers Energy
R Corn Belt Power Cooperative
R Dairyland Power Cooperative
R Dayton Power and Light Company
R Deseret Generation & Transmission Cooperative
R Detroit Edison
R Duke Energy Corporation
R Duke Energy North America (Western Region) — CA Assets: Moss Landing, Morro Bay, Oakland and South Bay Plants
R Duquesne Light Company

Electric Power Industry Year 2000 Status Update

R Dynegy Power Corporation
R East Kentucky Power Cooperative, Inc.
R East Texas Electric Cooperative, Inc
R Eastern Utilities (Blackstone Valley Electric Co., Eastern Edison Co., & Montaup Electric Co.)
R EF Kenilworth (Sithe)
R El Paso Electric Company
R Electric Energy, Inc.
R Empire District Electric Company
R Énergie Maclaren
R Entergy Services, Inc., acting for itself and as an agent for certain affiliated and associate companies including Arkansas P & L Co., Gulf States Utilities, Louisiana P & L Co., Mississippi P & L Co., & New Orleans Public Service Co.)
R EPCOR — Edmonton Power, Aqualta, Eltec
R ERCOT ISO
R ESBI Alberta Ltd.
R Eugene Water & Electric Board
RE FirstEnergy Corporation (formerly Cleveland Electric Illuminating Co., Toledo Edison Co., Ohio Edison Co., & Pennsylvania Power Co.)
R Florida Municipal Power Agency
R Florida Power and Light Company
R Florida Power Corporation
R Fort Pierce Utilities Authority
R Gainesville Regional Utilities
R Golden Valley Electric Association (GVEA)
R GPU Companies (GPU Energy, GPU Genco, GPU Nuclear, and GPU Service)
R GPU International FRCC
R GPU International MAAC
R GPU International NPCC
R GPU International SERC
R GPU International WSCC
R Grand River Dam Authority
R Great River Energy
R Green Mountain Power Corporation
R Hastings Utilities
R Hawaiian Electric Company, Inc., Maui Electric Co., and Hawaii Electric Light Co.
R Hoosier Energy Rural Electric Cooperative, Inc.
R Hudson Light & Power Department
R Hydro-Québec
R Idaho Power Company
R Illinois Power Company
RE Imperial Irrigation District
R Independence Power and Light
R Indiana Municipal Power Agency
R IPALCO Enterprises, Inc. (Including all Subsidiaries)

Electric Power Industry Year 2000 Status Update

R Ipswich Municipal Utilities Dept.
R ISO New England Inc.
R Jacksonville Electric Authority
R Jasper-Newton Electric Cooperative, Inc. (Texas)
R Kansas City Power & Light Company
R Kansas Electric Power Cooperative, Inc.
R KeySpan Energy (Generation) and Long Island Power Authority (T&D)
R Kissimmee Utility Authority
R Lafayette Utilities System
R Lake Worth Utilities
R Lakeland Electric, City of Lakeland
R Lansing, Michigan Board of Water & Light
R Lincoln Electric System
R Lockport Cogen Facility
R Los Angeles Department of Water & Power
R Louisiana Energy and Power Authority (LEPA)
R Louisville Gas & Electric Utility Company, Kentucky Utilities Company, and Western Kentucky Energy
R Lower Colorado River Authority (LCRA)
R Madison Gas and Electric Company
R Maine Public Service Company
R Manitoba Hydro
R MAPP Center
R Maritime Electric Company, Limited
R Massachusetts Municipal Wholesale Electric Company
R Metropolitan Water District of Southern California
R Mid-America Interconnected Network, Inc.
R MidAmerican Energy Company
R Milford Power LP
R Minnesota Power
R Minnkota Power Cooperative, Inc.
R Modesto Irrigation District
R Montana Power Company
R Montana-Dakota Utilities Company
R Mt. Carmel Public Utility Company
R Muscatine Power and Water
RE Nashville Electric Service
R Nebraska Public Power District
RE Nevada Power Company
R New Brunswick Power Corporation
R New Century Energies (Public Service Company of Colorado and Southwestern Public Service)
R New England Electric System Companies
R New Smyrna Beach, Florida
R New York Power Authority
R New York Power Pool (NY ISO)
R New York State Electric & Gas Corporation
R Niagara Mohawk Power Corporation
R Northeast Utilities System

Electric Power Industry Year 2000 Status Update

RE Northern Indiana Public Service Company
R Northern States Power Company
R Northland Power Inc. (Cochrane Power Corp, Kirkland Lake Power Corp, Iroquois Falls Power Corp)
R Northwestern Public Service
R Nova Scotia Power Inc.
R Ohio Valley Electric Corporation and Indiana-Kentucky Electric Corporation
R Oklahoma Gas and Electric
R Old Dominion Electric Cooperative
R Omaha Public Power District
R Ontario Hydro
R Orange and Rockland Utilities, Inc.
R Orlando Utilities Commission
R Otter Tail Power Company
R Owensboro Municipal Utilities
R Oxbow Geothermal Corporation
R Oxbow Power of North Tonawanda, New York
R Pacific Gas and Electric Company
R Pacific Northwest Security Coordinator
R PacifiCorp
R Panola-Harrison Electric Cooperative, Inc. (Texas)
R PECO Energy
R Pend Orielle PUD
R Pennsylvania Power & Light, Inc.
R PG&E Generating FRCC (formerly U.S. Generating Company)
R PG&E Generating MAAC (formerly U.S. Generating Company)
R PG&E Generating NE NPCC (formerly U.S. Generating Company)
R PG&E Generating NPCC (formerly U.S. Generating Company)
R PG&E Generating WSCC (formerly U.S. Generating Company)
RE PJM Interconnection, L. L. C.
R Plains Electric Generation and Transmission Cooperative, Inc.
R Platte River Power Authority
R Portland General Electric Company
R Potomac Electric Power Company
R Power City Partners, L.P. (Sithe)
R Power Pool of Alberta [Alberta Power Pool]
R Public Service Company of New Mexico
R Public Service Enterprise Group (PSEG)
R Public Utilities Board of the City of Brownsville
R Public Utility District No. 1 of Douglas County
R Public Utility District No. 2 of Grant County
R Puget Sound Energy
R Reading Municipal Light Department
R Reedy Creek Energy Services, Inc. as agent for the Reedy Creek Improvement District
R Reliant Energy Power Generation Inc. (formerly Houston Industries Inc.)
R Reliant Energy, Inc. (formerly Houston Industries Inc.)
R Rochester Gas & Electric Corp.

Electric Power Industry Year 2000 Status Update

R Sacramento Municipal Utility District
R Salt River Project
R Sam Rayburn G&T Inc.
R San Diego Gas & Electric
R Santee Cooper (South Carolina Public Service)
R Saskatchewan Power Corporation
R Seattle City Light Department
R Seminole Electric Cooperative, Inc.
R Seneca Power Partners, L.P. (a subsidiary of Sithe Energies, Inc.)
R Shrewsbury Electric Light Plant
R Sierra Pacific Power Company
R Sithe Energies, Inc., Oxnard Energy Facility
R Sithe Independence Power Partners
R Sithe Medway, Framingham & Edgar L.L.C.'s
R Sithe Mystic L.L.C.
R Sithe New Boston L.L.C.
R Snohomish County PUD
R South Carolina Electric & Gas Company (SCANA)
R South Mississippi Electric Power Association
R South Texas Electric Cooperative / Medina Electric Coop.
R Southeastern Power Administration
R Southern California Edison
R Southern Company (including Alabama Power Co., Georgia Power Co., Gulf Power Co., Mississippi Power Co., and Savannah Electric)
R Southern Energy, Inc. — Birchwood (Sealston,Virginia)
R Southern Energy, Inc. — Canal (Sandwich, Massachusetts)
R Southern Energy, Inc. — Contra Costas (Antioch, California)
R Southern Energy, Inc. — Kendall (Cambridge, Massachusetts)
R Southern Energy, Inc. — Pittsburg (Pittsburg, California)
R Southern Energy, Inc. — Potrero (San Francisco, California)
R Southern Energy, Inc. — Stateline (Hammond, Indiana)
R Southern Illinois Power Cooperative
R Southern Indiana Gas and Electric (SIGECO)
R Southern Minnesota Municipal Power Agency
R Southwest Power Pool
R Southwestern Power Administration
R Soyland Power Cooperative, Inc.
R St. Joseph Light & Power Company
R Sterling Power Partners, L.P. (Sithe Energies, Inc.)
R Sunflower Electric Power Corporation
R Tacoma Public Utilities
R Tallahatchie Valley EPA
R Tampa Electric Company
R Taunton Municipal Lighting Plant
R Taylor Electric Cooperative, Inc.
R Tenaska Washington Partners, L.P.
R Tennessee Valley Authority
R Texas-New Mexico Power Company

Electric Power Industry Year 2000 Status Update

R Tex-La Electric Cooperative of Texas, Inc.
R Thermo Power & Electric Inc. (Sithe — Greeley Energy Facility)
R TransAlta Corporation
R TransAlta Energy Corporation
R Trigen Cinergy Westwood Operating Company
R Trigen Nassau Energy Corporation
R Tri-State Generation & Transmission Association, Inc.
R Tucson Electric Power Company
R Turlock Irrigation District
R TXU, formerly Texas Utilities
R U.S. Army Corps of Engineers, Seattle District
R UGI Utilities, Inc.
R United American Energy Corporation
R United Illuminating
R Unitil, including Concord Electric, Exeter & Hampton Electric, and Fitchburg Gas and Electric
R Upper Peninsula Power Company
R UtiliCorp United, Inc. (Missouri Public Service, West Plains Energy, West Virginia Power, Aquila Energy)
R Utility Board of the City of Key West "City Electric System"
R Vermont Electric Power Company Inc. (VELCO)
R Vineland Municipal Electric Utility
RE Virginia Power
R West Kootenay Power
R Western Area Power Administration
R Western Farmers Electric Cooperative
R Western Resources, Inc.
R Williams Generation Co. — Hazleton
R Winnipeg Hydro
R Wisconsin Electric Power Company
R Wisconsin Public Power Inc.
R Wisconsin Public Service Corporation
R Wisvest CT, L.L.C.
R Yadkin, Inc.

Appendix B

Non-Nuclear List of Exceptions

Electric Power Industry Year 2000 Status Update

Non-nuclear Exception Reports

The following non-nuclear exception items have been reported to NERC. There are 17 organizations remaining with exception items. NERC continues to track these items and provides an updated status report about weekly on the NERC Y2k web site at http://www.nerc.com/y2k. Items that have been completed since the August 3, 1999 report are shown with a check.

Legend:
CEMS = Continuous Emissions Monitoring System
DCS = Distributed Control System
EMS = Energy Management System
HW = Hardware
OASIS = Open Access Same-time Information System
SCADA = Supervisory Control and Data Acquisition
SW = Software
UNK = Unknown

Bolded organization codes indicate open exception still remaining.
Bolded dates indicate stated schedule has been missed.

Organization	Facilities, Components, or Devices	Scheduled Completion	Done	Justification
4516	- Communications (leased)	6/30	√	Pending vendor completion
1760	- SCADA	9/30	√	Final testing
8524	- Relays - RFL9745 relays	7/15 7/15	√ √	Pending final testing Pending final testing
6811	- SCADA	7/23	√	Vendor availability
1973	- Control center computers - Data acquisition - Data communications	7/30 7/30 7/30	√ √ √	Vendor availability Vendor availability Vendor availability
9167	- SCADA	7/30	√	Vendor availability
4553	- DCS - DCS - EMS/SCADA	9/30 9/30 10/5	√ √ √	Vendor availability Vendor availability Vendor availability
8234	- DCS - CEMS - DCS - CEMS	9/11 7/31 9/30 7/31	√ √ √ √	Vendor availability Pending final testing Vendor availability Pending final testing
5648	- CEMS - CEMS	7/31 7/31	√ √	Pending final testing Vendor availability
3507	- CEMS - DCS	8/31 7/31	√ √	Vendor availability Maintenance outage
2112	- Boiler controls - SCADA	7/31 7/31	√ √	Vendor availability Pending cutover to new system
7760	- EMS	7/31	√	Pending cutover to new system
5997	- CEMS - Turbine vibration display	7/31 7/31	√ √	Vendor availability Ongoing work

Electric Power Industry Year 2000 Status Update

2177	- Boiler feed system controls	8/15	√	Maintenance outage
	- Turbine generator	8/15	√	Maintenance outage
8525	- CEMS	8/30	√	Maintenance outage
2188	- DCS	8/30	√	Pending final testing
3090	- Security monitoring SW	**11/17**		New system replacement
	- Reserve planning SW	**11/17**		New system replacement
	- SCADA	**11/17**		New system replacement
6744	- EMS	10/31	√	Vendor availability
8409	- TOC analyzer	8/31	√	Pending final testing
	- DCS	7/31	√	Pending final testing
	- DCS	10/31	√	Pending final certification
2516	- PLC	9/30	√	Pending final testing
	- PC Map SW	10/31	√	Pending final testing
	- DCS	7/31	√	Maintenance outage
	- CEMS	7/31	√	Pending final testing
1442	- Radio system	8/31	√	Vendor availability
1794	- Network analysis software upgrade	10/31	√	Vendor availability
	- Application software	10/27	√	Pending final testing
	- Data acquisition	8/1	√	Pending final testing
5297	- SCADA	8/31	√	Vendor availability
1802	- Distribution center	8/31	√	Manpower constraints
	- Distribution center	8/31	√	Manpower constraints
3178	- SCADA	10/15	√	Pending repair of new system
3561	- Energy scheduling and contracts	**10/31**		Vendor availability
	- Unit commitment	8/31	√	Pending final testing
	- OASIS	8/31	√	Vendor availability
	- Old EMS	**10/31**		Pending decommissioning
3680	- SCADA	8/31	√	Vendor availability
2078	- SCADA/EMS	10/15	√	Vendor availability
	- Generator control system	10/15	√	Vendor availability
3111	- DCS	9/15	√	Maintenance outage
2139	- DCS	9/1	√	Maintenance outage
	- Gas flow meter	9/1	√	Maintenance outage
	- DCS	9/30	√	Pending final testing
4003	- CEMS	9/1	√	Vendor availability
5161	- SCADA	9/1	√	Installation after summer
2015	- DCS	9/6	√	Maintenance outage
1388	- EMS	9/15	√	Cutover pending end of summer
6165	- CEMS	9/20	√	Vendor availability
	- Master station	9/17	√	Vendor availability
	- CEMS	9/11	√	Vendor availability
	- LAN HW and SW	7/30	√	Work in progress
9364	- SCADA	11/5	√	Vendor availability
	- SCADA	8/16	√	Vendor availability
	- Customer information system	8/30	√	New system installation
8261	- Communications systems -	9/30	√	Vendor availability/new installs

Electric Power Industry Year 2000 Status Update

	- CEMS	9/30	√	Vendor availability
2914	- Combustion turbine	11/30	√	Maintenance outage
7877	- Radio system	9/30	√	Vendor availability
	- Boiler feed pump control	9/30	√	Maintenance outage
1062	- Voice system customer center	9/30	√	Vendor availability
	- EMS	8/31	√	Vendor availability
2462	- Customer service system	9/30	√	Maintenance outage
5864	- CEMS	9/30	√	Vendor availability
	- CEMS	9/30	√	Vendor availability
	- EMS	9/1	√	Vendor availability
	- Customer information system	9/1	√	Vendor availability
	- Meter program SW	9/30	√	Vendor availability
6921	- CEMS	9/30	√	Vendor availability
	- SCADA	9/30	√	Pending final installation
	- Boiler feed controls	7/23	√	Vendor availability
	- Turbine generator controls	8/1	√	Vendor availability
	- Customer information system	9/16	√	Computer HW upgrade
	- Fixed asset system	9/30	√	Computer HW upgrade
2134	- Gas turbine controls	9/30	√	Vendor availability
4521	- SCADA	9/30	√	Manpower constraints
	- Customer information system	9/30	√	Manpower constraints
4063	- Control center computers	9/30	√	Pending final testing
	- Backup control center	9/30	√	Pending final testing
7615	- ISIS controls	9/30	√	Vendor availability
	- ISIS controls	9/30	√	Vendor availability
	- ISIS controls	9/30	√	Vendor availability
	- ISIS controls	9/30	√	Vendor availability
	- SVC system PC and clock	8/31	√	Vendor availability
	- Tie line metering conversion	8/30	√	Original schedule on track
	- Capacitor bank	9/30	√	Vendor availability
5816	- Governor controls	10/28	√	Maintenance outage
	- Governor controls	10/22	√	Maintenance outage
	- Governor controls	8/31	√	Vendor availability
6454	- Remote terminal unit	9/30	√	Vendor availability
5167	- CEMS	9/30	√	Vendor availability
	- SCADA	9/30	√	Vendor availability
	- Power scheduling/ accounting	9/30	√	Vendor availability
	- Billing system	7/30	√	Vendor availability
6530	- EMS/SCADA	10/1	√	Vendor availability
	- Telephone system	9/1	√	System replacement
	- CEMS	**11/30**		Vendor availability
9671	- CEMS	**11/20**		Maintenance outage
7677	- Boiler controls	**10/15**		Vendor availability
	- WAN/LAN	**10/1**		Vendor availability
2079	- Customer service system	**11/30**		Vendor availability

Electric Power Industry Year 2000 Status Update

	- Generator integrated test	9/30	√	Maintenance outage
	- EMS/SCADA	10/15	√	Vendor availability
1572	- Generator integrated test	10/31	√	Maintenance outage
	- Generator integrated test	9/30	√	Maintenance outage
	- Microwave alarm system	10/31	√	Vendor availability
	- CEMS	9/15	√	Vendor availability
6425	- SCADA	10/31	√	Vendor availability
1781	- DCS	10/15	√	Maintenance outage
	- DCS	10/8	√	Maintenance outage
	- DCS	**12/15**		Maintenance outage
5796	- DCS	**11/30**		Vendor availability
	- DEH programmer	8/1	√	Vendor availability
	- DCS	10/31	√	Vendor availability
	- Scan 3000	8/1	√	Vendor availability
	- DCS	10/31	√	Vendor availability
	- DEH programmer	8/1	√	Vendor availability
	- CEMS	11/1	√	Maintenance outage
	- DCS	10/31	√	Vendor availability
5540	- Controller	**11/1**		Vendor availability
	- Controller	**11/1**		Vendor availability
1142	- DCS	**11/20**		Maintenance outage
	- CEMS	9/30	√	Vendor availability
	- CEMS	**11/15**		Vendor availability
7199	- DCS	**11/18**		Maintenance outage
	- Mobile radio	11/1	√	Vendor availability
	- ACD switch	10/31	√	Now in progress
	- CEMS	**11/15**		Vendor availability
1765	- Controller	**11/19**		Vendor availability
	- EMS	10/31	√	Vendor availability
1746	- Data acquisition	**11/30**		Maintenance outage
	- Data acquisition	10/31	√	Maintenance outage
	- EMS/SCADA	10/31	√	Vendor availability
7339	- CEMS	11/30	√	Pending regulatory requirements
	- CEMS	11/30	√	Pending regulatory requirements
	- CEMS	11/30	√	Pending regulatory requirements
	- CEMS	11/30	√	Pending regulatory requirements
	- CEMS	11/30	√	Pending regulatory requirements
6538	- Coal handling controls	9/17	√	Vendor availability
	- DCS	8/31	√	Vendor availability
	- Combustion controls	7/15	√	Vendor availability
	- Scubber controls	8/31	√	Maintenance outage
	- Burner controls	9/17	√	Maintenance outage
3364	- DCS	**11/30**		Vendor availability
1514	- TSIE PROM upgrade	12/1	√	Maintenance outage
	- Precipitator controls	10/1	√	Maintenance outage
2350	- Customer service system	10/1	√	Remediate existing system
2169	- CEMS	10/1	√	Vendor availability
4208	- GPS Clock	8/15	√	Vendor availability

Electric Power Industry Year 2000 Status Update

	- Radio system	8/15	√	Vendor availability
1711	- EMS/SCADA	9/30	√	Vendor availability
	- Transmission project	10/30	√	Vendor availability
	- Customer info system	10/30	√	Vendor availability
1648	- DCS	**11/30**		Vendor availability
6361	- CEMS software	10/1	√	Vendor availability
	- DCS software	10/31	√	Maintenance outage
8466	- DCS	**12/15**		Maintenance outage
3203	- DCS	**2/11/2000**		Long-term maintenance outage (unit rebuild)
	- CEMS	**12/1**		Vendor availability
3648	- Temperature monitor	9/1	√	Date will be rolled back
	- DAS	9/1	√	Date will be rolled back
	- OIS	9/1	√	Vendor availability
	- DCS	9/1	√	Vendor availability
	- DAS software	11/1	√	Vendor availability
	- Envirocom	11/1	√	Vendor availability
	- Programmable RPU	9/1	√	Vendor availability
	- Controller	11/1	√	Maintenance outage
	- DAS	11/1	√	Vendor availability
5192	- CEMS	12/1	√	Maintenance outage
7268	- Boiler feedpump ctrls	9/30	√	Vendor availability
5885	- Telephone system	9/13	√	Vendor schedule
6672	- Customer call center	**9/30**		Final testing
9106	- Billing system SW	9/12	√	Vendor schedule
8436	- DCS	11/1	√	Maintenance outage
	- CEMS	10/15	√	Maintenance outage
7901	- DCS	**8/31**		Vendor availability

Appendix C

American Public Power Association
Y2k Status Update of Public Power Entities

Electric Power Industry Year 2000 Status Update

American Public Power Association
2301 M Street, N.W.
Washington, D.C. 20037
202-467-2900; fax: 202-467-2910
www.APPAnet.org

Breakdown: APPA Year 2000 Survey Results

October 30, 1999

Survey Response

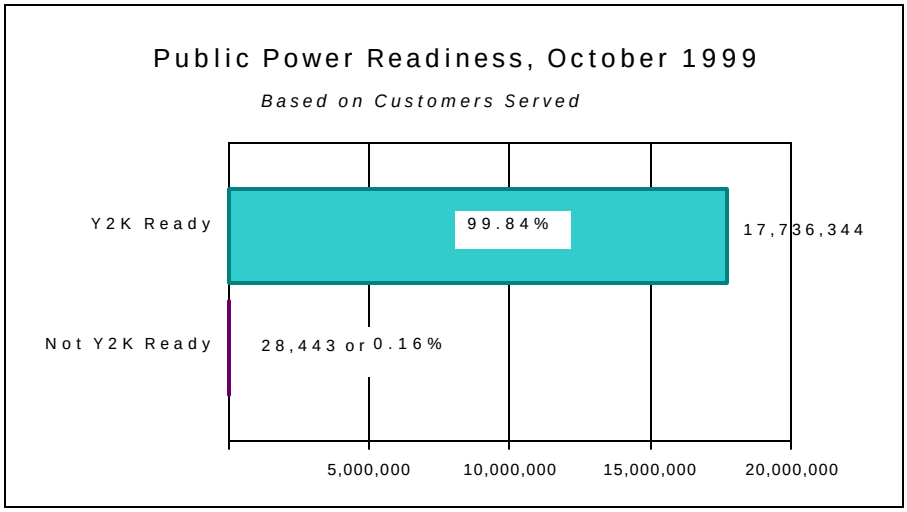
- In 1998, a total of **2,012 surveys** were sent to 240 large, 538 middle, and 1,234 small public power systems. Here "large" means public power utilities with more than 15,000 customer meters, plus major wholesale utilities; "middle" means systems with 3,000 to 15,000 customers, plus mid-sized wholesale utilities; and "small" means utilities with less than 3,000 customers.
- In March 1999, APPA re-surveyed the middle (538) and largest (240) public power systems. The **overall response** to this second survey was 91.9% (715 systems). In June 1999, APPA re-surveyed all 2,012 systems. The **overall response** to this survey was 86.3% (1,737 systems). In October 1999, APPA surveyed all systems that had not indicated "Y2K ready" in the August 1999 NERC report to DOE.
- Combining the four surveys, the **overall response** was 100% of utilities (2,012), representing approximately 17,764,787 ultimate metered customers of public power.*****
- The **response** to the large surveys was 100% (240), representing 12,959,981 meters or 72.95% of public power; to the middle surveys, 100% (538), representing 3,423,193 meters or 19.27% of public power; and to the small surveys, 100% (1,234), representing 1,381,613 meters or 7.78% of public power.

Readiness Estimates—All Surveys Combined, 99.84% of Public Power Y2K Ready

- In terms of customer meters, systems representing nearly 100% of the customers served by public power are "Y2K ready." The chart below provides more detail.

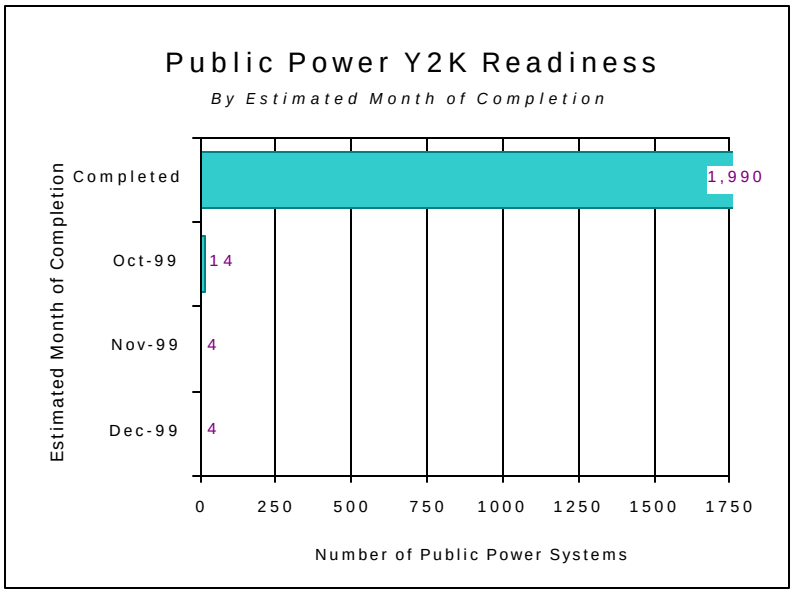
Electric Power Industry Year 2000 Status Update

Note that those reporting "Not Y2K Ready" represent approximately 1/7th of 1% of public power customers or 1/40th of



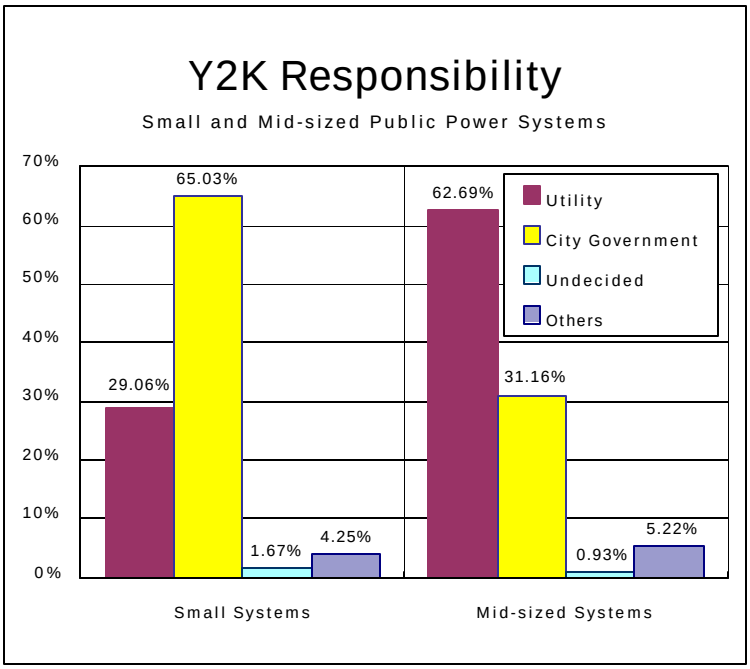
1% of the U.S. electric load.

- Of the 2,012 public power systems, 1,990 (98.86%) declared they are "Y2K ready" at this time. The remaining 22 systems all stated that they would be "Y2K Ready" by December 31, 1999. The chart below shows public power system Y2K readiness by **estimated month of completion**.



Electric Power Industry Year 2000 Status Update

Responsibility—Small and Middle Systems



- 29.06% of the small and 62.69% of the middle systems stated the **utility** was responsible for dealing with Y2K problems. 65.03% of the small and 31.16% of the middle stated the **city government** was responsible.
- 1.67% of the small and 0.93% of the middle were **undecided** who was responsible.
- 4.25% of small and 5.22% of middle systems stated **others** were responsible. "Others" ranged from city clerks to contracting companies.
- For the large systems, the **utility** was responsible for dealing with Y2K electricity matters.

Information and Planning—All

- 84.29% of all utilities say they already have **enough information** on the Y2K problem.
- 93.84% of the small have considered the impact on **informational and billing systems**; 82.45% of the small, the impact on **operational and embedded systems**; and 87.10% of the small have initiated **action** to pursue solutions.
- 100% of all systems have a **planning document**, provided by APPA. 92.72% of middle and 98.33% of large systems reported having an additional **written or unwritten plan** addressing the problem.
- For those middle and large systems responding to the **March 1999 survey**, their planning documents addressed the following areas, when applicable:

	Middle	Large
Generation Operations	90.18%	96.90%
EMS / SCADA	93.29%	99.44%
Telecommunications	90.66%	97.80%
Transmission Operations	88.81%	96.82%
Distribution Operations	99.18%	98.39%
Business Systems	97.62%	98.48%
Building/Utility Security	91.11%	93.92%

Electric Power Industry Year 2000 Status Update

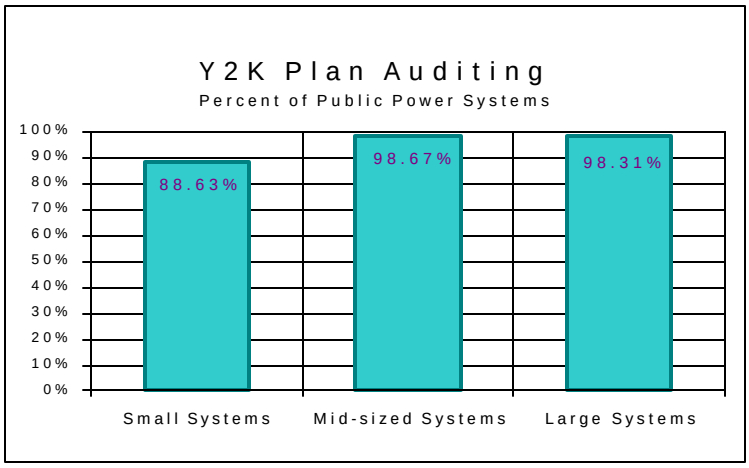
Testing and Results—From March 1999 Survey

- Speaking only of mission-critical systems, 73.08% of the middle and 82.76% of the large groups have completed **some testing**. For respondents completing some testing, **results** of the testing are as follows:

	Middle	Large
Zero impact on electric delivery systems	66.86%	47.90%
Minor impact on electric delivery systems	32.00%	52.10%
Major impact on electric delivery systems	0.57%	0.0%
100% failure of electric delivery systems	0.57%	0.0%

Contingency Planning—From June 1999 Survey

- Of the systems surveyed in June 1999, 91.81% of the middle and 96.20% of the large systems have **Y2K specific contingency plans** to maintain continuous operations.
- Although the North American Electric Reliability Council's September 8/9, 1999, Y2K planning drill is geared for the bulk electric systems in the U.S., 28.21% of the middle and 47.2% of the large public power systems **planned to participate** in the NERC Y2K drill.



- The U.S. Department of Energy in early 1999 asked whether electric utilities in the U.S. are performing an internal or external audit/review of their Y2K Programs. APPA's June 1999 data indicate that 92.98% of all public power systems are **performing Y2K program reviews**. The chart at the left provides further information.

Further Information

- For additional information, contact Michael J. Hyland, APPA's director of engineering services, by phone at 202-467-2986 or by e-mail at mhyland@APPAnet.org.

Appendix D

Honor Roll of Rural Electric Cooperatives Considered by NRECA to be Y2k Ready

Electric Power Industry Year 2000 Status Update

NRECA believes the following rural electric cooperatives are Y2k Ready as of November 1, 1999:

Cooperatives	State
Alaska Village Electric Cooperative	AK
Barrow Utilities & Electric Cooperative	AK
Chugach Electric Association, Inc.	AK
Copper Valley Electric Association, Inc.	AK
Cordova Electric Cooperative	AK
Golden Valley Electric Association, Inc.	AK
Homer Electric Association, Inc.	AK
I-N-N Electric Cooperative, Inc.	AK
Kodiak Electric Association, Inc.	AK
Kotzebue Electric Association, Inc.	AK
Matanuska Electric Association, Inc.	AK
Naknek Electric Association, Inc.	AK
Nushagak Electric Cooperative, Inc.	AK
Unalakleet Valley Electric Cooperative	AK
Yakutat Power, Inc.	AK
Arab Electric Cooperative	AL
Baldwin County Electric Membership Corp	AL
Black Warrior Electric Membership Corp	AL
Central Alabama Electric Cooperative	AL
Cherokee Electric Cooperative	AL
Clarke-Washington Electric Membership Corp	AL
Coosa Valley Electric Cooperative, Inc.	AL
Covington Electric Cooperative	AL
Cullman Electric Cooperative	AL
Dixie Electric Cooperative	AL
Franklin Electric Cooperative, Inc.	AL
Joe Wheeler Electric Membership Corp	AL
Marshall DeKalb Electric Cooperative	AL
North Alabama Electric Cooperative	AL
Pea River Electric Cooperative	AL
Pioneer Electric Cooperative	AL
Sand Mountain Electric Cooperative	AL
South Alabama Electric Cooperative	AL
Southern Pine Electric Cooperative	AL
Tallapoosa River Electric Cooperative	AL
Tombigbee Electric Cooperative, Inc.	AL
Wiregrass Electric Cooperative, Inc.	AL
Arkansas Valley Electric Cooperative Corp.	AR
Ashley-Chicot Electric Cooperative, Inc.	AR
C & L Electric Cooperative Corp.	AR
Carroll Electric Cooperative Corp.	AR
Clay County Electric Cooperative Corp.	AR
Craighead Electric Cooperative Corp.	AR
Farmers Electric Cooperative Corp.	AR
First Electric Cooperative Corp.	AR
North Arkansas Electric Cooperative, Inc.	AR
Ouachita Electric Cooperative Corp.	AR
Ozarks Electric Cooperative Corp.	AR
Petit Jean Electric Cooperative	AR
Rich Mountain Electric Cooperative, Inc.	AR

Electric Power Industry Year 2000 Status Update

South Central Arkansas Electric Cooperative	AR
Southwest Arkansas Electric Cooperative Corp	AR
Woodruff Electric Cooperative Corp.	AR
Duncan Valley Electric Cooperative, Inc.	AZ
Graham County Electric Cooperative, Inc.	AZ
Navajo Tribal Utility Authority	AZ
Navopache Electric Cooperative, Inc.	AZ
Sulphur Springs Valley Electric Cooperative	AZ
Trico Electric Cooperative, Inc.	AZ
Anza Electric Cooperative, Inc.	CA
Plumas-Sierra Rural Electric Cooperative	CA
Surprise Valley Electrification	CA
Delta-Montrose Electric Association	CO
Empire Electric Association, Inc.	CO
Grand Valley Rural Power Lines	CO
Gunnison County Electric Association	CO
Highline Electric Association	CO
Holy Cross Energy	CO
Intermountain Rural Electric Association	CO
KC Electric Association	CO
La Plata Electric Association, Inc.	CO
Morgan County Rural Electric Association	CO
Mountain Parks Electric, Inc.	CO
Mountain View Electric Association, Inc.	CO
Poudre Valley Rural Electric Association, Inc.	CO
San Isabel Electric Association	CO
San Luis Valley Rural Electric Cooperative, Inc.	CO
San Miguel Power Association, Inc.	CO
Sangre De Cristo Electric Association	CO
Southeast Colorado Power Association	CO
United Power, Inc.	CO
White River Electric Association, Inc.	CO
Yampa Valley Electric Association, Inc.	CO
YW Electric Association, Inc.	CO
Delaware Electric Cooperative, Inc.	DE
Central Florida Electric Cooperative	FL
Choctawhatchee Electric Cooperative, Inc.	FL
Clay Electric Cooperative, Inc.	FL
Escambia River Electric Cooperative, Inc.	FL
Florida Keys Electric Cooperative Association	FL
Glades Electric Cooperative, Inc.	FL
Gulf Coast Electric Cooperative, Inc.	FL
Lee County Electric Cooperative, Inc.	FL
Peace River Electric Cooperative, Inc.	FL
Sumter Electric Cooperative, Inc.	FL
Suwannee Valley Electric Cooperative	FL
Talquin Electric Cooperative, Inc.	FL
Tri-County Electric Cooperative, Inc.	FL
West Florida Electric Cooperative Association	FL
Withlacoochee River Electric Cooperative	FL
Altamaha Electric Membership Corp	GA
Amicalola Electric Membership Corp	GA
Blue Ridge Mountain Electric Membership Corp	GA
Canoochee Electric Membership Corp	GA

Electric Power Industry Year 2000 Status Update

Carroll Electric Membership Corp	GA
Central Georgia Electric Membership Corp	GA
Coastal Electric Membership Corp	GA
Cobb Electric Membership Corp	GA
Colquitt Electric Membership Corp	GA
Coweta-Fayette Electric Membership Corp	GA
Excelsior Electric Membership Corp	GA
Flint Electric Membership Corp	GA
Grady Electric Membership Corp	GA
GreyStone Power Corporation	GA
Habersham Electric Membership Corp	GA
Hart Electric Membership Corp	GA
Irwin Electric Membership Corp	GA
Jackson Electric Membership Corp	GA
Jefferson Energy Cooperative	GA
Lamar Electric Membership Corp	GA
Little Ocmulgee Electric Membership Corp	GA
Middle Georgia Electric Membership Corp	GA
Mitchell Electric Membership Corp	GA
North Georgia Electric Membership Corp	GA
Ocmulgee Electric Membership Corp	GA
Oconee Electric Membership Corp	GA
Okefenoke Rural Electric Membership Corp	GA
Pataula Electric Membership Corp	GA
Planters Electric Membership Corp	GA
Rayle Electric Membership Corp	GA
Satilla Rural Electric Membership Corp	GA
Sawnee Electric Membership Corp	GA
Slash Pine Electric Membership Corp	GA
Snapping Shoals Electric Membership Corp	GA
Sumter Electric Membership Corp	GA
Three Notch Electric Membership Corp	GA
Tri-County Electric Membership Corp	GA
Tri-State Electric Membership Corp	GA
Troup Electric Membership Corp.	GA
Upson County Electric Membership Corp	GA
Walton Electric Membership Corp	GA
Washington Electric Membership Corp	GA
Allamakee-Clayton Electric Cooperative, Inc.	IA
Boone Valley Electric Cooperative	IA
Butler County Rural Electric Cooperative	IA
Calhoun County Electric Cooperative Association	IA
Chariton Valley Electric Cooperative	IA
Clarke Electric Cooperative, Inc.	IA
East-Central Iowa Rural Electric Cooperative	IA
Eastern Iowa Light & Power Cooperative	IA
Farmers Electric Cooperative, Inc.	IA
Farmers Electric Cooperative-Kalona	IA
Franklin Rural Electric Cooperative	IA
Grundy County Rural Electric Cooperative	IA
Guthrie County Rural Electric Cooperative Association	IA
Harrison County Rural Electric Cooperative	IA
Hawkeye Tri-County Rural Electric Cooperative	IA
Heartland Power Cooperative	IA

Electric Power Industry Year 2000 Status Update

Humboldt County Rural Electric Cooperative	IA
Iowa Lakes Electric Cooperative	IA
Lyon Rural Electric Cooperative	IA
Maquoketa Valley Rural Electric Cooperative	IA
Marshall County Rural Electric Cooperative	IA
Midland Power Cooperative	IA
Nishnabotna Valley Rural Electric Cooperative	IA
North West Rural Electric Cooperative	IA
Osceola Electric Cooperative, Inc.	IA
Pella Cooperative Electric Association	IA
Rideta Electric Cooperative, Inc.	IA
Sac County Rural Electric Cooperative	IA
Southeast Iowa Cooperative Electric Association	IA
Southern Iowa Electric Cooperative, Inc.	IA
Southwest Iowa Service Cooperative	IA
TIP Rural Electric Cooperative	IA
Western Iowa Power Cooperative	IA
Woodbury County Rural Electric Cooperative Association	IA
Wright County Rural Electric Cooperative	IA
Clearwater Power Company	ID
Fall River Rural Electric Cooperative, Inc.	ID
Idaho County Light & Power Cooperative	ID
Kootenai Electric Cooperative, Inc.	ID
Lost River Electric Cooperative, Inc.	ID
Northern Lights, Inc.	ID
Raft River Rural Electric Cooperative, Inc.	ID
Riverside Electric Company	ID
Salmon River Electric Cooperative, Inc.	ID
South Side Electric Lines, Inc.	ID
United Electric Cooperative	ID
Adams Electric Cooperative	IL
Clay Electric Cooperative, Inc.	IL
Coles-Moultrie Electric Cooperative	IL
Corn Belt Electric Cooperative, Inc.	IL
Eastern Illini Electric Cooperative	IL
Egyptian Electric Cooperative Association	IL
Ener Star	IL
Farmers Mutual Electric Company	IL
Illinois Rural Electric Co.	IL
Jo-Carroll Electric Cooperative, Inc.	IL
McDonough Power Cooperative	IL
Menard Electric Cooperative	IL
MJM Electric Cooperative, Inc.	IL
Monroe County Electric Cooperative	IL
Norris Electric Cooperative	IL
Shelby Electric Cooperative	IL
Southeastern Illinois Electric Cooperative	IL
Southern Illinois Electric Cooperative	IL
Southwestern Electric Cooperative, Inc.	IL
Spoon River Electric Cooperative, Inc.	IL
Tri-County Electric Cooperative, Inc.	IL
Wayne-White Counties Electric Cooperative	IL
Western Illinois Electrical Coop.	IL
Bartholomew County Rural Electric Membership Corp	IN

Electric Power Industry Year 2000 Status Update

Boone County Rural Electric Membership Corp	IN
Carroll County Rural Electric Membership Corp	IN
Central Indiana Power	IN
Clark County Rural Electric Membership Corp	IN
Daviess-Martin County Rural Electric Membership Corp	IN
Decatur County Rural Electric Membership Corp	IN
Dubois Rural Electric Cooperative, Inc.	IN
Fulton County Rural Electric Membership Corp	IN
Hendricks Power Cooperative	IN
Henry County Rural Electric Membership Corp	IN
Jackson County Rural Electric Membership Corp	IN
Jasper County Rural Electric Membership Corp	IN
Jay County Rural Electric Membership Corp	IN
Johnson County Rural Electric Membership Corp	IN
Kankakee Valley Rural Electric Membership Corp	IN
Kosciusko County Rural Electric Membership Corp	IN
LaGrange County Rural Electric Membership Corp	IN
Marshall County Rural Electric Membership Corp	IN
Miami-Cass County Rural Electric Membership Corp	IN
Noble Rural Electric Membership Corp	IN
Northeastern Rural Electric Membership Corp	IN
Orange County Rural Electric Membership Corp	IN
Parke County Rural Electric Membership Corp	IN
Rush Shelby Energy	IN
South Central Indiana Rural Electric Membership Corp	IN
Southeastern Indiana Rural Electric Membership Corp	IN
Southern Indiana Rural Electric Cooperative, Inc.	IN
Steuben County Rural Electric Membership Corp	IN
Tipmont Rural Electric Membership Corp	IN
United Rural Electric Membership Corp	IN
Util Dist of Western IN Rural Elec Membership Corp	IN
Wabash County Rural Electric Membership Corp	IN
Warren County Rural Electric Membership Corp	IN
White County Rural Electric Membership Corp	IN
Whitewater Valley Rural Electric Membership Corp	IN
WIN Energy Rural Electric Membership Corp	IN
Ark Valley Electric Cooperative Association	KS
Bluestem Electric Cooperative	KS
Brown-Atchison Electric Cooperative Association	KS
Butler Rural Electric Cooperative Association, Inc.	KS
Caney Valley Electric Cooperative Association	KS
CMS Electric Cooperative, Inc.	KS
Doniphan Electric Cooperative Association, Inc.	KS
DS&O Rural Electric Cooperative Association	KS
Flint Hills Rural Electric Cooperative Association, Inc.	KS
Heartland Rural Electric Cooperative	KS
Jewell-Mitchell Cooperative Electric Co.	KS
Kaw Valley Electric Cooperative, Inc.	KS
Lane-Scott Electric Cooperative, Inc.	KS
Leavenworth-Jefferson Electric Cooperative	KS
NCK Electric Cooperative, Inc.	KS
Nemaha-Marshall Electric Cooperative	KS
Ninnescah Rural Electric Cooperative Association, Inc.	KS
Pioneer Electric Cooperative	KS

Electric Power Industry Year 2000 Status Update

Prairie Land Electric Cooperative Inc.	KS
Radiant Electric Cooperative, Inc.	KS
Sedgwick County Electric Cooperative	KS
Smoky Hill Electric Cooperative Association	KS
Sumner-Cowley Electric Cooperative, Inc.	KS
Twin Valley Electric Cooperative	KS
Victory Electric Cooperative Association, Inc.	KS
Western Cooperative Electric Association, Inc.	KS
Wheatland Electric Cooperative, Inc.	KS
Big Sandy Rural Electric Cooperative Corp	KY
Blue Grass Energy Cooperative Corp.	KY
Clark Energy Cooperative, Inc.	KY
Cumberland Valley Electric, Inc.	KY
Farmers Rural Electric Cooperative Corp	KY
Fleming-Mason Rural Electric Cooperative Corp	KY
Grayson Rural Electric Cooperative Corp	KY
Green River Electric Corp.	KY
Harrison County Rural Electric Cooperative Corp	KY
Henderson-Union Electric Cooperative	KY
Hickman-Fulton Counties Rural Electric Cooperative Corp	KY
Inter-County Rural Electric Cooperative Corp	KY
Jackson Energy Cooperative	KY
Jackson Purchase Energy	KY
Licking Valley Rural Electric Cooperative Corp	KY
Meade County Rural Electric Cooperative Corp	KY
Nolin Rural Electric Cooperative Corp	KY
Owen Electric Cooperative, Inc.	KY
Pennyrile Rural Electric Cooperative Corp	KY
Salt River Electric Cooperative Corp.	KY
Shelby Rural Energy Cooperative Corp.	KY
South Kentucky Rural Electric Cooperative Corp	KY
West Kentucky Rural Electric Cooperative Corp	KY
Beauregard Electric Cooperative, Inc.	LA
Claiborne Electric Cooperative, Inc.	LA
Concordia Electric Cooperative, Inc.	LA
Dixie Electric Membership Corp	LA
Jefferson Davis Electric Cooperative	LA
Northeast Louisiana Power Cooperative	LA
Pointe Coupee Electric Membership Corp	LA
South Louisiana Electric Cooperative	LA
Southwest Louisiana Electric Membership Corp	LA
Valley Electric Membership Corp	LA
Washington-St. Tammany Electric Cooperative	LA
Choptank Electric Cooperative, Inc.	MD
Southern Maryland Electric Cooperative	MD
Eastern Maine Electric Cooperative, Inc.	ME
Fox Islands Electric Cooperative	ME
Swans Island Electric Cooperative	ME
Alger-Delta Cooperative Electric Association	MI
Cherryland Electric Cooperative	MI
Cloverland Electric Cooperative	MI
Great Lakes Energy Cooperative	MI
HomeWorks Tri-County Electric Cooperative	MI
Midwest Energy Cooperative	MI

Electric Power Industry Year 2000 Status Update

Ontonagon County Rural Electric Association	MI
Presque Isle Electric & Gas Cooperative	MI
Thumb Electric Cooperative, Inc.	MI
Agralite Cooperative	MN
Arrowhead Electric Cooperative, Inc.	MN
Beltrami Electric Cooperative, Inc.	MN
Blue Earth-Niollet-Fairbault Cooperative Electric	MN
Brown County Rural Electric Association	MN
Clearwater-Polk Electric Cooperative	MN
Connexus Energy	MN
Cooperative Light & Power Association	MN
Crow Wing Cooperative Power & Light Co.	MN
Dakota Electric Association	MN
East Central Electric Association	MN
Federated Rural Electric Association	MN
Freeborn-Mower Cooperative Services	MN
Goodhue County Cooperative Electric Association	MN
Itasca-Mantrap Cooperative Electric Association	MN
Kandiyohi Power Cooperative	MN
Lake Country Power	MN
Lake Region Cooperative Electrical Association	MN
Lyon-Lincoln Electric Cooperative, Inc.	MN
McLeod Cooperative Power Association	MN
Meeker Cooperative Light & Power Association	MN
Mille Lacs Electric Cooperative	MN
Minnesota Valley Cooperative Light & Power	MN
Minnesota Valley Electric Cooperative	MN
Nobles Cooperative Electric	MN
North Itasca Electric Cooperative	MN
North Star Electric Cooperative, Inc.	MN
People's Cooperative Services	MN
PKM Electric Cooperative, Inc.	MN
Red Lake Electric Cooperative, Inc.	MN
Red River Valley Cooperative Power Association	MN
Redwood Electric Cooperative	MN
Renville-Sibley Cooperative Power Association	MN
Roseau Electric Cooperative, Inc.	MN
Runestone Electric Association	MN
South Central Electric Association	MN
Stearns Cooperative Electric Association	MN
Steele Waseca Cooperative Electric	MN
Todd-Wadena Electric Cooperative	MN
Traverse Electric Cooperative, Inc.	MN
Wild Rice Electric Cooperative, Inc.	MN
Wright-Hennepin Cooperative Electric Association	MN
Atchison-Holt Electric Cooperative	MO
Barry Electric Cooperative	MO
Barton County Electric Cooperative	MO
Black River Electric Cooperative	MO
Boone Electric Cooperative	MO
Callaway Electric Cooperative	MO
Central Missouri Electric Cooperative	MO
Citizens Electric Corp.	MO
Co-Mo Electric Cooperative, Inc.	MO

Electric Power Industry Year 2000 Status Update

Consolidated Electric Cooperative	MO
Crawford Electric Cooperative, Inc.	MO
Cuivre River Electric Cooperative, Inc.	MO
Farmers' Electric Cooperative, Inc.	MO
Grundy Electric Cooperative, Inc.	MO
Howard Electric Cooperative	MO
Howell-Oregon Electric Cooperative, Inc.	MO
Intercounty Electric Cooperative Association	MO
Laclede Electric Cooperative	MO
Lewis County Rural Electric Cooperative Association	MO
Macon Electric Cooperative	MO
Missouri Rural Electric Cooperative	MO
New-Mac Electric Cooperative, Inc.	MO
North Central Missouri Electric Cooperative	MO
Ozark Border Electric Cooperative	MO
Pemiscot-Dunklin Electric Cooperative	MO
Platte-Clay Electric Cooperative, Inc.	MO
Ralls County Electric Cooperative	MO
Sac-Osage Electric Cooperative, Inc.	MO
Scott-New Madrid-Mississippi Electric Cooperative	MO
Se-Ma-No Electric Cooperative	MO
Southwest Electric Cooperative	MO
Three Rivers Electric Cooperative	MO
Tri-County Electric Cooperative Association	MO
United Electric Cooperative	MO
Webster Electric Cooperative	MO
West Central Electric Cooperative, Inc.	MO
White River Valley Electric Cooperative	MO
Alcorn County Electric Power Association	MS
Central Electric Power Association	MS
Coahoma Electric Power Association	MS
Coast Electric Power Association	MS
Delta Electric Power Association	MS
Dixie Electric Power Association	MS
East Mississippi Electric Power Association	MS
Four County Electric Power Association	MS
Magnolia Electric Power Association	MS
Monroe County Electric Power Association	MS
Natchez Trace Electric Power	MS
North East Mississippi Electric Power Association	MS
Northcentral Mississippi Electric Power Association	MS
Pearl River Valley Electric Power Assn	MS
Pontotoc Electric Power Association	MS
Prentiss County Electric Power Association	MS
Singing River Electric Power Association	MS
Southern Pine Electric Power Association	MS
Southwest Mississippi Electric Power Association	MS
Tallahatchie Valley Electric Power Association	MS
Tippah Electric Power Association	MS
Tishomingo County Electric Power Association	MS
Tombigbee Electric Power Association	MS
Twin County Electric Power Association	MS
Yazoo Valley Electric Power Association	MS
Beartooth Electric Cooperative, Inc.	MT

Electric Power Industry Year 2000 Status Update

Big Flat Electric Cooperative, Inc.	MT
Big Horn County Electric Cooperative	MT
Fergus Electric Cooperative, Inc.	MT
Flathead Electric Cooperative, Inc.	MT
Glacier Electric Cooperative, Inc.	MT
Goldenwest Electric Cooperative, Inc.	MT
Hill County Electric Cooperative, Inc.	MT
Lincoln Electric Cooperative, Inc.	MT
Lower Yellowstone Rural Electric Association, Inc.	MT
Marias River Electric Cooperative, Inc.	MT
McCone Electric Cooperative, Inc.	MT
Mid-Yellowstone Electric Cooperative	MT
Missoula Electric Cooperative, Inc.	MT
Northern Electric Cooperative, Inc.	MT
Park Electric Cooperative, Inc.	MT
Ravalli County Electric Cooperative, Inc.	MT
Sheridan Electric Cooperative, Inc.	MT
Southeast Electric Cooperative, Inc.	MT
Sun River Electric Cooperative, Inc.	MT
Tongue River Electric Cooperative, Inc.	MT
Valley Electric Cooperative, Inc.	MT
Vigilante Electric Cooperative, Inc.	MT
Yellowstone Valley Electric Cooperative	MT
Albemarle Electric Membership Corp	NC
Blue Ridge Electric Membership Corp	NC
Brunswick Electric Membership Corp	NC
Cape Hatteras Electric Cooperative	NC
Carteret-Craven Electric Cooperative	NC
Central Electric Membership Corp	NC
EnergyUnited	NC
Four County Electric Membership Corp	NC
French Broad Electric Membership Corp	NC
Halifax Electric Membership Corp	NC
Harkers Island Electric Membership Corp	NC
Haywood Electric Membership Corp	NC
Jones-Onslow Electric Membership Corp	NC
Lumbee River Electric Membership Corp	NC
Pee Dee Electric Membership Corp	NC
Piedmont Electric Membership Corp	NC
Pitt & Greene Electric Membership Corp	NC
Randolph Electric Membership Corp	NC
Roanoke Electric Cooperative	NC
Rutherford Electric Membership Corp	NC
South River Electric Membership Corp	NC
Surry-Yadkin Electric Membership Corp	NC
Tideland Electric Membership Corp	NC
Tri-County Electric Membership Corp	NC
Union Electric Membership Corp	NC
Wake Electric Membership Corp	NC
Burke-Divide Electric Cooperative, Inc.	ND
Capital Electric Cooperative, Inc.	ND
Cass County Electric Cooperative, Inc.	ND
Cavalier Rural Electric Cooperative	ND
James Valley Electric Cooperative, Inc.	ND

Electric Power Industry Year 2000 Status Update

KEM Electric Cooperative, Inc.	ND
McKenzie Electric Cooperative, Inc.	ND
McLean Electric Cooperative, Inc.	ND
Mor-Gran-Sou Electric Cooperative, Inc.	ND
Mountrail Williams Electric Cooperative	ND
Nodak Electric Cooperative, Inc.	ND
North Central Electric Cooperative, Inc.	ND
Northern Plains Electric Cooperative	ND
Oliver-Mercer Electric Cooperative, Inc.	ND
RSR Electric Cooperative, Inc.	ND
Sheyenne Valley Electric Cooperative	ND
Slope Electric Cooperative, Inc.	ND
Verendrye Electric Cooperative, Inc.	ND
West Plains Electric Cooperative, Inc.	ND
Burt County Public Power District	NE
Butler County Rural Public Power District	NE
Cedar-Knox Public Power District	NE
Chimney Rock Public Power District	NE
Cornhusker Public Power District	NE
Cuming County Public Power District	NE
Custer Public Power District	NE
Dawson County Public Power District	NE
Elkhorn Rural Public Power District	NE
Howard Greeley Rural Public Power District	NE
KBR Rural Public Power District	NE
Loup River Public Power District	NE
Loup Valleys Rural Public Power District	NE
McCook Public Power District	NE
Midwest Electric Cooperative Corporation	NE
Niobrara Valley Electric Membership Corp	NE
Norris Public Power District	NE
North Central Public Power District	NE
Northeast Nebraska Public Power District	NE
Northwest Rural Public Power District	NE
Panhandle Rural Electric Membership Association	NE
Polk County Rural Public Power District	NE
Roosevelt Public Power District	NE
Seward County Rural Public Power District	NE
South Central Public Power District	NE
Southern Nebraska Rural Public Power District	NE
Southwest Public Power District	NE
Stanton County Public Power District	NE
Twin Valleys Public Power District	NE
Wheat Belt Public Power District	NE
York County Rural Public Power District	NE
New Hampshire Electric Cooperative	NH
Sussex Rural Electric Cooperative	NJ
Central Valley Electric Cooperative, Inc.	NM
Columbus Electric Cooperative, Inc.	NM
Continental Divide Electric Co-op	NM
Farmers Electric Cooperative, Inc.	NM
Kit Carson Electric Cooperative, Inc.	NM
Lea County Electric Cooperative, Inc.	NM
Mora-San Miguel Electric Cooperative	NM

Electric Power Industry Year 2000 Status Update

Northern Rio Arriba Electric Cooperative	NM
Otero County Electric Cooperative, Inc.	NM
Roosevelt County Electric Cooperative	NM
Sierra Electric Cooperative	NM
Socorro Electric Cooperative, Inc.	NM
Southwestern Electric Cooperative, Inc.	NM
Springer Electric Cooperative, Inc.	NM
Lincoln County Power District #1	NV
Mt. Wheeler Power, Inc.	NV
Valley Electric Association	NV
Wells Rural Electric Cooperative	NV
Delaware County Electric Cooperative	NY
Oneida-Madison Electric Cooperative, Inc.	NY
Otsego Electric Cooperative, Inc.	NY
Steuben Rural Electric Cooperative, Inc.	NY
Adams Rural Electric Cooperative, Inc.	OH
Buckeye Rural Electric Cooperative, Inc.	OH
Butler Rural Electric Cooperative, Inc.	OH
Carroll Electric Cooperative, Inc.	OH
Consolidated Electric Cooperative	OH
Darke Rural Electric Cooperative, Inc.	OH
Firelands Electric Cooperative, Inc.	OH
Frontier Power Company	OH
Guernsey-Muskingum Electric Cooperative, Inc.	OH
Hancock-Wood Electric Cooperative, Inc.	OH
Holmes-Wayne Electric Cooperative, Inc.	OH
Licking Rural Electrification, Inc.	OH
Logan County Cooperative Power & Light Association	OH
Lorain Medina Rural Electric Cooperative, Inc.	OH
Mid Ohio Energy Co-op	OH
Midwest Electric, Inc.	OH
North Central Electric Cooperative, Inc.	OH
North Western Electric Cooperative, Inc.	OH
Paulding-Putnam Electric Cooperative	OH
Pioneer Rural Electric Cooperative, Inc.	OH
South Central Power Company	OH
Tricounty Rural Electric Cooperative, Inc.	OH
Washington Electric Cooperative, Inc.	OH
Alfalfa Electric Cooperative, Inc.	OK
Caddo Electric Cooperative	OK
Canadian Valley Electric Cooperative, Inc.	OK
Central Rural Electric Cooperative	OK
Choctaw Electric Cooperative, Inc.	OK
Cimarron Electric Cooperative	OK
Cookson Hills Electric Cooperative, Inc.	OK
Cotton Electric Cooperative	OK
East Central Oklahoma Electric Cooperative	OK
Harmon Electric Association, Inc.	OK
Indian Electric Cooperative, Inc.	OK
Kay Electric Cooperative	OK
Kiamichi Electric Cooperative, Inc.	OK
Kiwash Electric Cooperative, Inc.	OK
Lake Region Electric Cooperative, Inc.	OK
Northeast Oklahoma Electric Cooperative	OK

Electric Power Industry Year 2000 Status Update

Northfork Electric Cooperative	OK
Northwestern Electric Cooperative, Inc.	OK
Oklahoma Electric Cooperative	OK
People's Electric Cooperative	OK
Red River Valley Rural Electric Association	OK
Rural Electric Cooperative, Inc.	OK
Southeastern Electric Cooperative, Inc.	OK
Southwest Rural Electric Association	OK
Tri-County Electric Cooperative, Inc.	OK
Verdigris Valley Electric Cooperative, Inc.	OK
Blachly-Lane Co. Cooperative Electric Association	OR
Central Electric Cooperative, Inc.	OR
Columbia Basin Electric Cooperative	OR
Columbia Power Cooperative Association	OR
Consumers Power, Inc.	OR
Coos-Curry Electric Cooperative, Inc.	OR
Douglas Electric Cooperative, Inc.	OR
Harney Electric Cooperative, Inc.	OR
Hood River Electric Cooperative	OR
Lane Electric Cooperative	OR
Midstate Electric Cooperative, Inc.	OR
Oregon Trail Electric Consumers Cooperative	OR
Salem Electric	OR
Tillamook P.U.D.	OR
Umatilla Electric Cooperative	OR
Wasco Electric Cooperative, Inc.	OR
West Oregon Electric Cooperative, Inc.	OR
Adams Electric Cooperative, Inc.	PA
Bedford Rural Electric Cooperative, Inc.	PA
Central Electric Cooperative, Inc.	PA
Claverack Rural Electric Cooperative	PA
New Enterprise Rural Electric Cooperative	PA
Northwestern Rural Electric Cooperative Association, Inc.	PA
Somerset Rural Electric Cooperative, Inc.	PA
Southwest Central Rural Electric Cooperative Corp	PA
Sullivan County Rural Electric Cooperative, Inc.	PA
Tri-County Rural Electric Cooperative, Inc.	PA
United Electric Cooperative, Inc.	PA
Valley Rural Electric Cooperative, Inc.	PA
Warren Electric Cooperative, Inc.	PA
Aiken Electric Cooperative, Inc.	SC
Berkeley Electric Cooperative, Inc.	SC
Black River Electric Cooperative, Inc.	SC
Blue Ridge Electric Cooperative, Inc.	SC
Broad River Electric Cooperative, Inc.	SC
Coastal Electric Cooperative, Inc.	SC
Edisto Electric Cooperative, Inc.	SC
Fairfield Electric Cooperative, Inc.	SC
Horry Electric Cooperative, Inc.	SC
Little River Electric Cooperative, Inc.	SC
Lynches River Electric Cooperative, Inc.	SC
Marlboro Electric Cooperative, Inc.	SC
Mid-Carolina Electric Cooperative, Inc.	SC
Newberry Electric Cooperative	SC

Electric Power Industry Year 2000 Status Update

Palmetto Electric Cooperative, Inc.	SC
Pee Dee Electric Cooperative, Inc.	SC
Santee Electric Cooperative, Inc.	SC
Tri-County Electric Cooperative, Inc.	SC
York Electric Cooperative, Inc.	SC
Black Hills Electric Cooperative, Inc.	SD
Bon Homme Yankton Electric Association	SD
Butte Electric Cooperative, Inc.	SD
Cam-Wal Electric Cooperative, Inc.	SD
Charles Mix Electric Association, Inc.	SD
Cherry-Todd Electric Cooperative, Inc.	SD
Clay-Union Electric Corp.	SD
Codington-Clark Electric Cooperative	SD
Dakota Energy Cooperative, Inc.	SD
Douglas Electric Cooperative, Inc.	SD
FEM Electric Association, Inc.	SD
Grand Electric Cooperative, Inc.	SD
H-D Electric Cooperative, Inc.	SD
Intercounty Electric Association, Inc.	SD
Kingsbury Electric Cooperative, Inc.	SD
Lacreek Electric Association, Inc.	SD
Lake Region Electric Association, Inc.	SD
Lincoln-Union Electric Co.	SD
McCook Electric Cooperative, Inc.	SD
Moreau Grand Electric Cooperative, Inc.	SD
Northern Electric Cooperative, Inc.	SD
Rosebud Electric Cooperative, Inc.	SD
Sioux Valley-Southwestern Electric Cooperative	SD
Tri-County Electric Association, Inc.	SD
Turner-Hutchinson Electric Cooperative	SD
Union County Electric Cooperative, Inc.	SD
West River Electric Association, Inc.	SD
Whetstone Valley Electric Cooperative	SD
Appalachian Electric Cooperative	TN
Caney Fork Electric Cooperative, Inc.	TN
Chickasaw Electric Cooperative	TN
Cumberland Electric Membership Corp	TN
Duck River Electric Membership Corp	TN
Fayetteville Electric System	TN
Forked Deer Electric Cooperative, Inc.	TN
Fort Loudoun Electric Cooperative	TN
Gibson Electric Membership Corp	TN
Holston Electric Cooperative, Inc.	TN
LaFollette Utilities	TN
Meriwether Lewis Electric Cooperative	TN
Middle Tennessee Electric Membership Corp	TN
Mountain Electric Cooperative	TN
Pickwick Electric Cooperative	TN
Plateau Electric Cooperative	TN
Powell Valley Electric Cooperative	TN
Sequachee Valley Electric Cooperative	TN
Southwest Tennessee Electric Membership Corp	TN
Tennessee Valley Electric Cooperative	TN
Tri-County Electric Membership Corp	TN

Electric Power Industry Year 2000 Status Update

Upper Cumberland Electric Membership Corp	TN
Volunteer Electric Cooperative	TN
Bailey County Electric Cooperative, Inc.	TX
Bandera Electric Cooperative, Inc.	TX
Bartlett Electric Cooperative, Inc.	TX
Belfalls Electric Cooperative, Inc.	TX
Big Country Electric Cooprative	TX
Bluebonnet Electric Cooperative, Inc.	TX
Bowie-Cass Electric Cooperative, Inc.	TX
Cap Rock Electric Cooperative, Inc.	TX
Central Texas Electric Cooperative, Inc.	TX
Cherokee County Electric Cooperative Association	TX
Coleman County Electric Cooperative, Inc.	TX
Comanche County Electric Cooperative Association	TX
Concho Valley Electric Cooperative, Inc.	TX
Cooke County Electric Cooperative Association	TX
CoServ Electric	TX
Deaf Smith Electric Cooperative, Inc.	TX
Deep East Texas Electric Cooperative, Inc.	TX
DeWitt County Electric Cooperative Inc.	TX
Dickens Electric Cooperative, Inc.	TX
Erath County Electric Cooperative Association	TX
Fannin County Electric Cooperative, Inc.	TX
Farmers Electric Cooperative, Inc.	TX
Fayette Electric Cooperative, Inc.	TX
Fort Belknap Electric Cooperative, Inc.	TX
Gate City Electric Cooperative, Inc.	TX
Grayson-Collin Electric Cooperative, Inc.	TX
Greenbelt Electric Cooperative, Inc.	TX
Guadalupe Valley Electric Cooperative, Inc.	TX
Hamilton County Electric Cooperative Association	TX
Hill County Electric Cooperative	TX
Houston County Electric Cooperative, Inc.	TX
J-A-C Electric Cooperative Inc.	TX
Jackson Electric Cooperative, Inc.	TX
Jasper-Newton Electric Cooperative, Inc.	TX
Johnson County Electric Cooperative Association	TX
Karnes Electric Cooperative, Inc.	TX
Kimble Electric Cooperative, Inc.	TX
Lamar County Electric Cooperative Association	TX
Lamb County Electric Cooperative, Inc.	TX
Lighthouse Electric Cooperative, Inc.	TX
Lyntegar Electric Cooperative, Inc.	TX
Magic Valley Electric Cooperative, Inc.	TX
McCulloch Electric Cooperative, Inc.	TX
McLennan County Electric Cooperative	TX
Medina Electric Cooperative, Inc.	TX
Mid-South Electric Cooperative Association	TX
Navarro County Electric Cooperative, Inc.	TX
Navasota Valley Electric Cooperative	TX
North Plains Electric Cooperative, Inc.	TX
Nueces Electric Cooperative, Inc.	TX
Panola-Harrison Electric Cooperative	TX
Pedernales Electric Cooperative, Inc.	TX

Electric Power Industry Year 2000 Status Update

Rio Grande Electric Cooperative, Inc.	TX
Rita Blanca Electric Cooperative, Inc.	TX
Rusk County Electric Cooperative, Inc.	TX
Sam Houston Electric Cooperative, Inc.	TX
San Bernard Electric Cooperative, Inc.	TX
San Patricio Electric Cooperative, Inc.	TX
South Plains Electric Cooperative, Inc.	TX
Southwest Texas Electric Cooperative, Inc.	TX
Swisher Electric Cooperative, Inc.	TX
Taylor Electric Cooperative, Inc.	TX
Tri-County Electric Cooperative, Inc.	TX
Trinity Valley Electric Cooperative	TX
Upshur Rural Electric Cooperative Corp	TX
Victoria County Electric Cooperative, Inc.	TX
Wharton County Electric Cooperative, Inc.	TX
Wise Electric Cooperative, Inc.	TX
Wood County Electric Cooperative, Inc.	TX
Dixie-Escalante Rural Electric Association	UT
Flowell Electric Association, Inc.	UT
GarKane Power Association, Inc.	UT
Moon Lake Electric Association, Inc.	UT
A & N Electric Cooperative	VA
BARC Electric Cooperative	VA
Central Virginia Electric Cooperative	VA
Community Electric Cooperative	VA
Craig-Botetourt Electric Cooperative	VA
Mecklenburg Electric Cooperative	VA
Northern Neck Electric Cooperative	VA
Northern Virginia Electric Cooperative	VA
Prince George Electric Cooperative	VA
Rappahannock Electric Cooperative	VA
Shenandoah Valley Electric Cooperative, Inc.	VA
Southside Electric Cooperative	VA
Vermont Electric Cooperative, Inc.	VT
Washington Electric Cooperative, Inc.	VT
Benton Rural Electric Association	WA
Big Bend Electric Cooperative, Inc.	WA
Columbia Rural Electric Association, Inc.	WA
Elmhurst Mutual Power & Light Co.	WA
Inland Power & Light Company	WA
Nespelem Valley Electric Cooperative	WA
OHOP Mutual Light Company	WA
Okanogan County Electric Cooperative	WA
Orcas Power & Light Company	WA
Parkland Light & Water Company	WA
Peninsula Light Company	WA
Tanner Electric	WA
Adams-Columbia Electric Cooperative	WI
Barron Electric Cooperative	WI
Bayfield Electric Cooperative, Inc.	WI
Central Wisconsin Electric Cooperative	WI
Chippewa Valley Electric Cooperative	WI
Clark Electric Cooperative	WI
Dunn County Electric Cooperative	WI

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Eau Claire Electric Cooperative	WI
Grant-Lafayette Electric Cooperative	WI
Head of the Lakes Electric Cooperative	WI
Jackson Electric Cooperative	WI
Jump River Electric Cooperative	WI
Oakdale Electric Cooperative	WI
Oconto Electric Cooperative	WI
Pierce-Pepin Electric Cooperative	WI
Polk-Burnett Electric Cooperative	WI
Price Electric Cooperative, Inc.	WI
Richland Electric Cooperative	WI
Rock County Electric Cooperative Association	WI
St. Croix County Electric Cooperative	WI
Taylor Electric Cooperative	WI
Trempealeau Elec	WI
Vernon Electric Cooperative	WI
Washington Island Electric Cooperative, Inc.	WI
Harrison Rural Electric Association, Inc.	WV
Big Horn Rural Electric Cooperative	WY
Bridger Valley Electric Association, Inc.	WY
Carbon Power & Light, Inc.	WY
Garland Light & Power Co.	WY
Lower Valley Power & Light, Inc.	WY
Niobrara Electric Association, Inc.	WY
Powder River Energy Corp.	WY
Rural Electric Company, Inc.	WY
Wheatland Rural Electric Association	WY
Wyrulec Company	WY